

What is claimed is:

- 1           1.       A system for providing passive screening of transient messages in  
2       a distributed computing environment, comprising:  
3           a network interface passively monitoring a transient packet stream at a  
4       network boundary comprising receiving incoming datagrams structured in  
5       compliance with a network protocol layer;  
6           a packet receiver reassembling one or more of the incoming datagrams  
7       into a segment structured in compliance with a transport protocol layer; and  
8           an antivirus scanner scanning contents of the reassembled segment for a  
9       presence of at least one of a computer virus and malware to identify infected  
10      message contents.
- 1           2.       A system according to Claim 1, further comprising:  
2           an incoming queue staging each incoming datagram intermediate to  
3       reassembly.
- 1           3.       A system according to Claim 1, further comprising:  
2           a network protocol-specific decoder decoding the reassembled segment  
3       prior to scanning.
- 1           4.       A system according to Claim 1, wherein the antivirus scanner  
2       terminates the transient packet stream if the reassembled segment is not infected  
3       with at least one of a computer virus and malware.
- 1           5.       A system according to Claim 1, wherein the antivirus scanner takes  
2       an action if the reassembled segment is infected with at least one of a computer  
3       virus and malware.
- 1           6.       A system according to Claim 5, wherein the action comprises at  
2       least one of logging an infection; generating a warning; spoofing a valid datagram  
3       in place of the infected datagram; and acquiescing to the infection.
- 1           7.       A system according to Claim 1, further comprising:

2 a protocol-specific queue staging each reassembled segment with other  
3 reassembled segments sharing the same transport protocol layer.

1 8. A system according to Claim 7, further comprising:  
2 an information record storing information dependent on the same transport  
3 protocol layer with the staged reassembled segment.

1 9. A system according to Claim 8, further comprising:  
2 a contents record storing the contents with the staged reassembled  
3 segment.

1 10. A system according to Claim 8, wherein the information comprises  
2 at least one of a source address, source port number, destination address,  
3 destination port number, URL, file name, user name, sender identification,  
4 recipient identification, and subject.

1 11. A system according to Claim 1, further comprising:  
2 a protocol-specific module processing each reassembled datagram based  
3 on the transport layer protocol employed by the reassembled datagram.

1 12. A system according to Claim 11, wherein the transport layer  
2 protocol comprises at least one of HTTP, FTP, SMTP, POP3, NNTP, and  
3 Gnutella.

1 13. A system according to Claim 1, further comprising:  
2 an event correlator analyzing the transient packet stream for events  
3 indicative of a network service attack.

1 14. A system according to Claim 13, further comprising:  
2 a data repository maintaining each event.

1 15. A system according to Claim 1, wherein the distributed computing  
2 environment is TCP/IP-compliant and each incoming message is SMTP-  
3 compliant.

1           16.    A method for providing passive screening of transient messages in  
2 a distributed computing environment, comprising:  
3           passively monitoring a transient packet stream at a network boundary  
4 comprising receiving incoming datagrams structured in compliance with a  
5 network protocol layer;  
6           reassembling one or more of the incoming datagrams into a segment  
7 structured in compliance with a transport protocol layer; and  
8           scanning contents of the reassembled segment for a presence of at least  
9 one of a computer virus and malware to identify infected message contents.

1           17.    A method according to Claim 16, further comprising:  
2 staging each incoming datagram intermediate to reassembly.

1           18.    A method according to Claim 16, further comprising:  
2 decoding the reassembled segment prior to scanning.

1           19.    A method according to Claim 16, further comprising:  
2 terminating the transient packet stream if the reassembled segment is not  
3 infected with at least one of a computer virus and malware.

1           20.    A method according to Claim 16, further comprising:  
2 taking an action if the reassembled segment is infected with at least one of  
3 a computer virus and malware.

1           21.    A method according to Claim 20, further comprising:  
2 executing the action, comprising at least one of:  
3           logging an infection;  
4           generating a warning;  
5           spoofing a valid datagram in place of the infected datagram; and  
6           acquiescing to the infection.

1           22.    A method according to Claim 16, further comprising:

2 staging each reassembled segment with other reassembled segments  
3 sharing the same transport protocol layer.

1 23. A method according to Claim 22, further comprising:  
2 storing information dependent on the same transport protocol layer with  
3 the staged reassembled segment.

1 24. A method according to Claim 23, further comprising:  
2 storing the contents with the staged reassembled segment.

1 25. A method according to Claim 23, wherein the information  
2 comprises at least one of a source address, source port number, destination  
3 address, destination port number, URL, file name, user name, sender  
4 identification, recipient identification, and subject.

1 26. A method according to Claim 16, further comprising:  
2 processing each reassembled datagram based on the transport layer  
3 protocol employed by the reassembled datagram.

1 27. A method according to Claim 26, wherein the transport layer  
2 protocol comprises at least one of HTTP, FTP, SMTP, POP3, NNTP, and  
3 Gnutella.

1 28. A method according to Claim 16, further comprising:  
2 analyzing the transient packet stream for events indicative of a network  
3 service attack.

1 29. A method according to Claim 28, further comprising:  
2 maintaining each event in a data repository.

1 30. A method according to Claim 16, wherein the distributed  
2 computing environment is TCP/IP-compliant and each incoming message is  
3 SMTP-compliant.

1           31.    A computer-readable storage medium holding code for performing  
2   the method according to Claims 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28,  
3   29, or 30.

1           32.    A system for passively detecting computer viruses and malware  
2   and denial of service-type network attacks in a distributed computing  
3   environment, comprising:  
4           a network interface receiving copies of datagrams transiting a boundary of  
5   a network domain into an incoming packet queue, each datagram being copied  
6   from a packet stream;  
7           a packet receiver reassembling one or more such datagrams from the  
8   incoming packet queue into network protocol packets, each staged in a  
9   reassembled packet queue;  
10          an antivirus scanner scanning each network protocol packet from the  
11   reassembled packet queue to ascertain an infection of at least one of a computer  
12   virus and malware; and  
13          an event correlator evaluating events identified from the datagrams in the  
14   packet stream to detect a denial of service-type network attack on the network  
15   domain.

1           33.    A system according to Claim 32, further comprising:  
2           a parser parsing each reassembled datagram into network protocol-specific  
3   information and packet content.

1           34.    A system according to Claim 33, wherein the network protocol-  
2   specific information comprises a source address, source port number, destination  
3   address, destination port number, and URL for HTTP; a file name and user name  
4   for FTP; and a sender identification, recipient identification, and subject for  
5   SMTP.

1           35.    A system according to Claim 33, further comprising:

2 a decoder decoding the packet content prior to performing the operation of  
3 scanning.

1 36. A system according to Claim 32, further comprising:  
2 a log logging an occurrence of at least one of the infection and the network  
3 attack.

1 37. A system according to Claim 32, further comprising:  
2 a warning module generating a warning responsive to an occurrence of at  
3 least one of the infection and the network attack.

1 38. A system according to Claim 32, further comprising:  
2 a spoof module sending a spoofed network protocol packet responsive to  
3 an occurrence of at least one of the infection and the network attack.

1 39. A system according to Claim 32, further comprising:  
2 one or more protocol-specific modules implementing one of HTTP, FTP,  
3 SMTP, POP3, NNTP, and Gnutella network protocols.

1 40. A system according to Claim 32, wherein the distributed  
2 computing environment is TCP/IP-compliant, each datagram is IP-compliant, and  
3 each network protocol packet is TCP-compliant.

1 41. A method for passively detecting computer viruses and malware  
2 and denial of service-type network attacks in a distributed computing  
3 environment, comprising:  
4 receiving copies of datagrams transiting a boundary of a network domain  
5 into an incoming packet queue, each datagram being copied from a packet stream;  
6 reassembling one or more such datagrams from the incoming packet queue  
7 into network protocol packets, each staged in a reassembled packet queue;  
8 scanning each network protocol packet from the reassembled packet queue  
9 to ascertain an infection of at least one of a computer virus and malware; and  
10 evaluating events identified from the datagrams in the packet stream to  
11 detect a denial of service-type network attack on the network domain.

1           42.    A method according to Claim 41, further comprising:  
2           parsing each reassembled datagram into network protocol-specific  
3           information and packet content.

1           43.    A method according to Claim 42, wherein the network protocol-  
2           specific information comprises a source address, source port number, destination  
3           address, destination port number, and URL for HTTP; a file name and user name  
4           for FTP; and a sender identification, recipient identification, and subject for  
5           SMTP.

1           44.    A method according to Claim 42, further comprising:  
2           decoding the packet content prior to performing the operation of scanning.

1           45.    A method according to Claim 41, further comprising:  
2           logging an occurrence of at least one of the infection and the network  
3           attack.

1           46.    A method according to Claim 41, further comprising:  
2           generating a warning responsive to an occurrence of at least one of the  
3           infection and the network attack.

1           47.    A method according to Claim 41, further comprising:  
2           sending a spoofed network protocol packet responsive to an occurrence of  
3           at least one of the infection and the network attack.

1           48.    A method according to Claim 41, further comprising:  
2           implementing at least one of HTTP, FTP, SMTP, POP3, NNTP, and  
3           Gnutella network protocols.

1           49.    A method according to Claim 41, wherein the distributed  
2           computing environment is TCP/IP-compliant, each datagram is IP-compliant, and  
3           each network protocol packet is TCP-compliant.

- 1           50.    A computer-readable storage medium holding code for performing
- 2   the method according to Claims 41, 42, 43, 44, 45, 46, 47, 48, or 49.

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